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(54) Title: STRENGTHENED CERAMIC RESTORATION

(57) Abstract: The present invention relates to a process for the preparation of a full-ceramic dental restoration, comprising heat pressing of a tooth coloured pressing glass on a fully or partially supporting structure of yttria doped tetragonal zirconia (YTZP), comprised of yttria doped tetragonal zirconia ceramic having a grain size, as measured by the linear intercept method, of less than 0.6 μm , wherein the pressing glass has a thermal expansion coefficient (TEC) of between 9.0 and 11.0 $\mu\text{m}/\text{m.K}$ (measured in the range of from 25 to 500°C) and wherein the pressing glass has a pressing temperature of between 750 and 1000°C. In a further aspect, the invention relates to a full-ceramic dental restoration, comprising a fully or partially supporting structure of yttria doped tetragonal zirconia (YTZP) and a heat pressed tooth coloured pressing glass, which restoration is modelled to be in occlusal contact with opposing teeth and in mesio-distal contact with neighbouring teeth.

INTERNATIONAL SEARCH REPORT

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PCT/NL 03/00616

A. CLASSIFICATION OF SUBJECT MATTER

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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 631 995 A (DENTSPLY GMBH) 4 January 1995 (1995-01-04) page 9, line 16 -page 10, line 22 claims ---	1-10
A	EP 0 218 853 A (TORAY INDUSTRIES) 22 April 1987 (1987-04-22) column 3, line 14 - line 21 column 13, line 9 - line 21 examples claims ---	1-10
A	US 2002/006532 A1 (ROBIN ARNAUD) 17 January 2002 (2002-01-17) paragraphs '0023!', '0024! claims ---	1-10
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 833 464 A (FOSE HANS PETER) 10 November 1998 (1998-11-10) column 4, line 34 - line 43 column 5, line 8 - line 40 claims	1-10
A	& DE 196 30 412 A (FOSE HANS PETER) 29 January 1998 (1998-01-29) cited in the application -----	

INTERNATIONAL SEARCH REPORT

International application No

PCT/NL 03/00616

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0631995	A	04-01-1995	AT 165591 T 15-05-1998
		AU 683050 B2 30-10-1997	
		AU 6309194 A 05-01-1995	
		CA 2124521 A1 25-12-1994	
		CN 1103283 A 07-06-1995	
		DE 69409873 D1 04-06-1998	
		DE 69409873 T2 27-08-1998	
		EP 0631995 A1 04-01-1995	
		FI 943016 A 25-12-1994	
		JP 7023986 A 27-01-1995	
		KR 273953 B1 15-12-2000	
		NO 942134 A 27-12-1994	
		US 5916498 A 29-06-1999	
		US 6126732 A 03-10-2000	
		US 5849068 A 15-12-1998	
		ZA 9404562 A 20-02-1995	
EP 0218853	A	22-04-1987	DE 3650137 D1 15-12-1994
		DE 3650137 T2 23-03-1995	
		EP 0218853 A1 22-04-1987	
		US 4742030 A 03-05-1988	
		JP 1897377 C 23-01-1995	
		JP 3029021 B 22-04-1991	
		JP 62153163 A 08-07-1987	
		KR 9500697 B1 27-01-1995	
US 2002006532	A1	17-01-2002	NONE
US 5833464	A	10-11-1998	DE 19630412 A1 29-01-1998
		CA 2211520 A1 26-01-1998	
		EP 0820754 A2 28-01-1998	
		JP 3218207 B2 15-10-2001	
		JP 10085240 A 07-04-1998	
		JP 2001286489 A 16-10-2001	